

WHAT I CLAIM IS:

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1. An inorganic binder having calcium silicate sites which are connected the one with the other by alumina-silica phosphate bonds, the calcium silicate sites acting as cross-linking sites for the alumina-silica phosphate bonds with a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.3 :1 and 10 :1.

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2. The binder of claim 1, in which the calcium silicate sites act as cross-linking sites for the alumina-silica phosphate bonds with a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.6 :1 and 6 :1.

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3. The binder of claim 1, in which substantially all calcium silicate sites are bound the one to the other by alumina-silica phosphate bonds.

4. The binder of claim 1, in which the weight ratio calcium silicate site / SiO_2 present in the alumina-silica phosphate bonds is greater than 1.

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5. The binder of claim 1, in which the weight ratio calcium silicate site / SiO_2 present in the alumina-silica phosphate bonds is greater than 1.5.

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6. The binder of claim 1, in which the calcium silicate sites are calcium meta silicate sites having a substantially acicular nature with a length/diameter ratio from 2/1 to 50/1.

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7. The binder of claim 1, in which the calcium silicate sites are calcium meta silicate sites having a substantially acicular nature with a length/diameter ratio from 3/1 to 20/1.

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8. The binder of claim 1, in which the calcium silicate sites are calcium meta silicate sites having a substantially acicular nature with a length/diameter ratio from 2/1 to 50/1, the calcium meta silicate sites having an average length from $10\mu\text{m}$ to 10mm.

9. The binder of claim 1, in which the calcium silicate sites are calcium meta silicate sites having a substantially acicular nature with a length/diameter ratio from 2/1 to 50/1, the calcium meta silicate sites having an average length from 50 μ m to 5 mm.
- 5 10. The binder of anyone of the claims 1, in which the weight ratio calcium silicate sites/alumina-silica phosphate bonds is comprised between 0.1 and 1.1.
11. The binder of anyone of the claims 1, in which the weight ratio calcium silicate sites/alumina-silica phosphate bonds is comprised between 0.3 and 0.9.
- 10 12. The binder of anyone of the claims 1, in which the weight ratio calcium silicate sites/alumina-silica phosphate bonds is comprised between 0.4 and 0.7.
- 15 13. A composition comprising at least :
an inorganic binder having calcium silicate sites which are connected the one with the other by alumina-silica phosphate bonds, the calcium silicate sites acting as cross-linking sites for the alumina-silica phosphate bonds with a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.3 :1 and 10 :1, and
20 a filler.
14. The composition of claim 13, in which the calcium silicate sites of the inorganic binder act as cross-linking sites for the alumina-silica phosphate bonds with a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.6 :1 and 6 :1.
- 25 15. The composition of claim 13, in which substantially all calcium silicate sites of the inorganic binder are bound the one to the other by alumina-silica phosphate bonds.
- 30 16. The composition of claim 13, in which the weight ratio calcium silicate site / SiO_2 present in the alumina-silica phosphate bonds of the inorganic binder is greater than 1.
- 35 17. The composition of claim 13, in which the weight ratio calcium silicate site / SiO_2 present in the alumina-silica phosphate bonds of the inorganic binder is greater than 1.5.

18. The composition of claim 13, in which the calcium silicate sites of the inorganic binder are calcium meta silicate sites having a substantially acicular nature with a length/diameter ratio from 2/1 to 50/1.
- 5 19. The composition of claim 13, in which the calcium silicate sites of the inorganic binder are calcium meta silicate sites having a substantially acicular nature with a length/diameter ratio from 3/1 to 20/1.
- 10 20. The composition of claim 13, in which the calcium silicate sites of the inorganic binder are calcium meta silicate sites having a substantially acicular nature with a length/diameter ratio from 2/1 to 50/1, the calcium meta silicate sites having an average length from 10 μ m to 10mm.
- 15 21. The composition of claim 13, in which the calcium silicate sites of the inorganic binder are calcium meta silicate sites having a substantially acicular nature with a length/diameter ratio from 2/1 to 50/1, the calcium meta silicate sites having an average length from 50 μ m to 5 mm.
- 20 22. The composition of claim 13, in which the weight ratio calcium silicate sites/alumina-silica phosphate bonds of the inorganic binder is comprised between 0.1 and 1.1.
- 25 23. The composition of claim 13, in which the weight ratio calcium silicate sites/alumina-silica phosphate bonds of the inorganic binder is comprised between 0.3 and 0.9.
- 30 24. The composition of claim 13, in which the weight ratio calcium silicate sites/alumina-silica phosphate bonds of the inorganic binder is comprised between 0.4 and 0.7.
25. The composition of claim 13, in which the filler is a silicon containing filler.
- 35 26. The composition of claim 13, in which the filler comprises silicon containing fibers with a length of less than 1000 μ m.

27. The composition of claim 13, which comprises silicon containing fibers with a length of less than $1000\mu\text{m}$, the weight content of silicon containing fibers with a length of less than $1000\mu\text{m}$ in the composition after its hardening and after removal of the possible free water being of at least 0.5%.

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28. A composition comprising at least :

an inorganic binder having calcium silicate sites which are connected the one with the other by alumina-silica phosphate bonds, the calcium silicate sites acting as cross-linking sites for the alumina-silica phosphate bonds with a weight ratio

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$\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.3 :1 and 10 :1, and

silicon containing fibers with a length of less than $1000\mu\text{m}$, the weight content of silicon containing fibers with a length of less than $1000\mu\text{m}$ in the composition after its hardening and after removal of the possible free water being of at least 0.5%.

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29. The composition of claim 28, which comprises silicon containing fibers with an average (in weight) length of less than $500\mu\text{m}$, the weight content of silicon containing fibers with an average length of less than $500\mu\text{m}$ in the composition after its hardening and after removal of the possible free water being of at least 0.5%.

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30. The composition of claim 28, which comprises silicon containing fibers with an average (in weight) length of more than $10\mu\text{m}$.

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31. The composition of claim 28, which comprises silicon containing fibers with an average (in weight) length of more than $20\mu\text{m}$.

32. The composition of claim 28, which comprises silicon containing fibers with an average (in weight) length comprised between $25\mu\text{m}$ and $300\mu\text{m}$.

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33. The composition of claim 28, which comprises silicon containing fibers with an average (in weight) length between $50\mu\text{m}$ and $250\mu\text{m}$.

34. The composition of claim 28, in which the silicon containing fibers with a length of less than $1000\mu\text{m}$ are substantially not reactive with the binder.

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35. The composition of claim 28, in which the silicon containing fibers with a length of less than $500\mu\text{m}$ are substantially not reactive with the binder.
36. The composition of claim 28, in which the silicon containing fibers with a
5 length of less than $1000\mu\text{m}$ are not reactive with the binder.
37. The composition of claim 28, in which the silicon containing fibers with a length of less than $500\mu\text{m}$ are not reactive with the binder.
- 10 38. The composition of claim 28, which, after hardening and removal of free water, comprises from 1% up to 85% by weight, silicon containing fibers with a length of less than $1000\mu\text{m}$, which are substantially not reactive with the binder.
39. The composition of claim 28, which, after hardening and removal of free water,
15 comprises from 1% up to 85% by weight, silicon containing fibers with a length of less than $1000\mu\text{m}$, which are not reactive with the binder.
40. The composition of claim 28, which, after hardening and removal of free water, comprises from 2% up to 75% by weight, silicon containing fibers with a length of
20 less than $1000\mu\text{m}$, which are not reactive with the binder.
41. The composition of claim 28, which, after hardening and removal of free water, comprises from 1% up to 85% by weight, silicon containing fibers with a length of less than $500\mu\text{m}$, which are not reactive with the binder.
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42. The composition of claim 28, which, after hardening and removal of free water, comprises from 2% up to 75% by weight, silicon containing fibers with a length of less than $500\mu\text{m}$, which are not reactive with the binder.
- 30 43. The composition of claim 28, which, after hardening and removal of free water, comprises from 20% up to 65% by weight silicon containing fibers with a length of less than $1000\mu\text{m}$ which are substantially not reactive with the binder.
44. The composition of claim 28, which, after hardening and removal of free water,
35 comprises from 30% up to 60% by weight silicon containing fibers with a length of less than $500\mu\text{m}$, which are not reactive with the binder.

45. The composition of claim 28, which further comprises silica flour with a particle size of less than $500\mu\text{m}$, the weight content of silica flour in the composition after its hardening and after removal of the possible free water being
5 of at least 0.5%.

45. The composition of claim 28, which further comprises silica flour with a particle size of less comprised between 2 and $400\mu\text{m}$, the weight content of silica flour in the composition after its hardening and after removal of the possible free
10 water being of at least 0.5%.

46. The composition of claim 28, which further comprises silica flour with an average (in weight) particle size comprised between 2 and $100\mu\text{m}$, the weight content of silica flour in the composition after its hardening and after removal of
15 the possible free water being comprised between 1 and 10%.

47. The composition of claim 28, which further comprises silica flour with an average (in weight) particle size comprised between 2 and $100\mu\text{m}$, the weight content of silica flour in the composition after its hardening and after removal of
20 the possible free water being comprised between 2 and 8%.

48. The composition of claim 28, which further comprises silica flour with an average (in weight) particle size comprised between 5 and $60\mu\text{m}$, the weight content of silica flour in the composition after its hardening and after removal of
25 the possible free water being comprised between 2 and 8%.

49. The composition of claim 28, which further comprises silica flour with an average (in weight) particle size comprised between 10 and $50\mu\text{m}$ the weight content of silica flour in the composition after its hardening and after removal of
30 the possible free water being comprised between 2 and 8%.

50. The composition of claim 28, which further comprises crystallized alumina silicate particles which are substantially not reactive with the binder and which have an average (in weight) particle size comprised between 5 and $100\mu\text{m}$, the
35 weight content of non reactive crystallized alumina silicate in the composition after

its hardening and after removal of the possible free water being comprised between 1 and 10%.

51. The composition of claim 28, which further comprises crystallized alumina
 5 silicate particles which are substantially not reactive with the binder and which
 have an average (in weight) particle size comprised between 5 and 100 μ m, the
 weight content of non reactive crystallized alumina silicate in the composition after
 its hardening and after removal of the possible free water being comprised between
 2 and 8%.

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52. The composition of claim 28, in which the calcium silicate sites of the
 inorganic binder act as cross-linking sites for the alumina-silica phosphate bonds
 with a weight ratio Al_2O_3/SiO_2 ranging from 0.6 :1 and 6 :1.

15 53. The composition of claim 28, in which the weight ratio calcium silicate site /
 SiO_2 present in the alumina-silica phosphate bonds of the inorganic binder is
 greater than 1.

54. The composition of claim 28, in which the weight ratio calcium silicate site /
 20 SiO_2 present in the alumina-silica phosphate bonds of the inorganic binder is
 greater than 1.5.

55. The composition of claim 28, in which the calcium silicate sites of the
 inorganic binder are calcium meta silicate sites having a substantially acicular
 25 nature with a length/diameter ratio from 2/1 to 50/1.

56. The composition of claim 28, in which the calcium silicate sites of the
 inorganic binder are calcium meta silicate sites having a substantially acicular
 nature with a length/diameter ratio from 3/1 to 20/1.

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57. The composition of claim 55, in which the calcium meta silicate sites has an
 average length from 10 μ m to 10mm.

58. The composition of claim 56, in which the calcium meta silicate sites has an
 35 average length from 50 μ m to 5 mm.

59. The composition of claim 28, in which the weight ratio calcium silicate sites/alumina-silica phosphate bonds of the inorganic binder is comprised between 0.1 and 1.1.

5 60. The composition of claim 28, in which the weight ratio calcium silicate sites/alumina-silica phosphate bonds of the inorganic binder is comprised between 0.3 and 0.9.

61. The composition of claim 28, in which the weight ratio calcium silicate
10 sites/alumina-silica phosphate bonds of the inorganic binder is comprised between 0.4 and 0.7.

62. A product comprising at least a hardened layer comprising an inorganic binder having calcium silicate sites which are connected the one with the other by
15 alumina-silica phosphate bonds, the calcium silicate sites acting as cross-linking sites for the alumina-silica phosphate bonds with a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.3 :1 and 10 :1.

63. the product of claim 62, in which the layer further comprises at least a filler.
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64. The product of claim 62, in which the hardened layer covers at least partly a face of a support element.

65. The product of claim 62, in which the hardened layer covers at least partly a
25 face of a support comprising a core which can be subjected to a water swelling, and in which at least partly a face not covered by hardened layer is provided with a water repellent coating.

66. The product of claim 65, in which the water repellent coating is a silicon
30 containing water repellent coating.

67. The product of claim 66, in which the water repellent coating is a fluoro silicon coating.

68. The product of claim 62, in which the hardened layer covers at least partly a face of a support comprising a core which can be subjected to a water swelling, and in which the faces not with a hardened layer are provided with a water repellent coating.

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69. The product of claim 68, in which the water repellent coating is a silicon containing water repellent coating.

70. The product of claim 62, in which the hardened layer covers at least partly a face of a support comprising a core which can be subjected to a water swelling, said face being provided with a water repellent coating.

71. The product of claim 62, in which the hardened layer comprises at least :
an inorganic binder having calcium silicate sites which are connected the one with
the other by alumina-silica phosphate bonds, the calcium silicate sites acting as
cross-linking sites for the alumina-silica phosphate bonds with a weight ratio
 $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.3 :1 and 10 :1, and
silicon containing fibers with a length of less than $1000\mu\text{m}$, the weight content of
silicon containing fibers with a length of less than $1000\mu\text{m}$ in the composition
after its hardening and after removal of the possible free water being of at least
0.5%.

72. The product of claim 71, which comprises silicon containing fibers with an average (in weight) length of less than $500\mu\text{m}$, the weight content of silicon containing fibers with an average length of less than $500\mu\text{m}$ in the composition after its hardening and after removal of the possible free water being of at least 0.5%.

73. The product of claim 62, in which the hardened layer comprises silicon containing fibers with an average (in weight) length of more than $10\mu\text{m}$.

74. The product of claim 62, in which the hardened layer comprises silicon containing fibers with an average (in weight) length of more than $20\mu\text{m}$.

75. The product of claim 62, in which the hardened layer comprises silicon containing fibers with an average (in weight) length comprised between $25\mu\text{m}$ and $300\mu\text{m}$.

5 76. The product of claim 62, in which the hardened layer comprises silicon containing fibers with an average (in weight) length between $50\mu\text{m}$ and $250\mu\text{m}$.

77. The product of claim 62, in which the hardened layer comprises silicon containing fibers with a length of less than $1000\mu\text{m}$ which are substantially not
10 reactive with the binder.

78. The product of claim 62, in which the hardened layer comprises silicon containing fibers with a length of less than $500\mu\text{m}$ which are substantially not reactive with the binder.

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79. The product of claim 62, in which the hardened layer comprises silicon containing fibers with a length of less than $1000\mu\text{m}$, which are not reactive with the binder.

20 80. The product of claim 62, in which the hardened layer comprises silicon containing fibers with a length of less than $500\mu\text{m}$ which are not reactive with the binder.

81. The product of claim 62, in which, after hardening and removal of free water,
25 the hardened layer comprises from 1% up to 85% by weight, silicon containing fibers with a length of less than $1000\mu\text{m}$, which are substantially not reactive with the binder.

82. The product of claim 62, in which, after hardening and removal of free water,
30 the hardened layer comprises from 1% up to 85% by weight, silicon containing fibers with a length of less than $1000\mu\text{m}$, which are not reactive with the binder.

83. The product of claim 62, in which, after hardening and removal of free water,
35 the hardened layer comprises from 2% up to 75% by weight, silicon containing fibers with a length of less than $1000\mu\text{m}$, which are not reactive with the binder.

84. The product of claim 62, in which, after hardening and removal of free water, the hardened layer comprises from 1% up to 85% by weight, silicon containing fibers with a length of less than $500\mu\text{m}$, which are not reactive with the binder.
- 5 85. The product of claim 62, in which, after hardening and removal of free water, the hardened layer comprises from 2% up to 75% by weight, silicon containing fibers with a length of less than $500\mu\text{m}$, which are not reactive with the binder.
- 10 86. The product of claim 62, in which, after hardening and removal of free water, the hardened layer comprises from 20% up to 65% by weight silicon containing fibers with a length of less than $1000\mu\text{m}$ which are substantially not reactive with the binder.
- 15 87. The product of claim 62, in which, after hardening and removal of free water, the hardened layer comprises from 30% up to 60% by weight silicon containing fibers with a length of less than $500\mu\text{m}$, which are not reactive with the binder.
- 20 88. The product of claim 62, in which the hardened layer further comprises silica flour with a particle size of less than $500\mu\text{m}$, the weight content of silica flour in the composition after its hardening and after removal of the possible free water being of at least 0.5%.
- 25 89. The product of claim 62, in which the hardened layer further comprises silica flour with a particle size of less comprised between 2 and $400\mu\text{m}$, the weight content of silica flour in the composition after its hardening and after removal of the possible free water being of at least 0.5%.
- 30 90. The product of claim 62, in which the hardened layer further comprises silica flour with an average (in weight) particle size comprised between 2 and $100\mu\text{m}$, the weight content of silica flour in the composition after its hardening and after removal of the possible free water being comprised between 1 and 10%.
- 35 91. The product of claim 62, in which the hardened layer further comprises silica flour with an average (in weight) particle size comprised between 2 and $100\mu\text{m}$, the weight content of silica flour in the composition after its hardening and after removal of the possible free water being comprised between 2 and 8%.

92. The product of claim 62, in which the hardened layer further comprises silica flour with an average (in weight) particle size comprised between 5 and 60 μ m, the weight content of silica flour in the composition after its hardening and after
5 removal of the possible free water being comprised between 2 and 8%.

93. The product of claim 62, in which the hardened layer further comprises silica flour with an average (in weight) particle size comprised between 10 and 50 μ m the weight content of silica flour in the composition after its hardening and after
10 removal of the possible free water being comprised between 2 and 8%.

94. The product of claim 62, in which the hardened layer further comprises crystallized alumina silicate particles which are substantially not reactive with the binder and which have an average (in weight) particle size comprised between 5
15 and 100 μ m, the weight content of non reactive crystallized alumina silicate in the composition after its hardening and after removal of the possible free water being comprised between 1 and 10%.

95. The product of claim 62, in which the hardened layer further comprises
20 crystallized alumina silicate particles which are substantially not reactive with the binder and which have an average (in weight) particle size comprised between 5 and 100 μ m, the weight content of non reactive crystallized alumina silicate in the composition after its hardening and after removal of the possible free water being comprised between 2 and 8%.

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96. The product of claim 62, in which the calcium silicate sites of the inorganic binder act as cross-linking sites for the alumina-silica phosphate bonds with a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.6 :1 and 6 :1.

30 97. The product of claim 62, in which the weight ratio calcium silicate site / SiO_2 present in the alumina-silica phosphate bonds of the inorganic binder is greater than 1.

98. The product of claim 62, in which the weight ratio calcium silicate site / SiO_2
35 present in the alumina-silica phosphate bonds of the inorganic binder is greater than 1.5.

99. The product of claim 62, in which the calcium silicate sites of the inorganic binder are calcium meta silicate sites having a substantially acicular nature with a length/diameter ratio from 2/1 to 50/1.

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100. The product of claim 62, in which the calcium silicate sites of the inorganic binder are calcium meta silicate sites having a substantially acicular nature with a length/diameter ratio from 3/1 to 20/1.

101. The product of claim 99, in which the calcium meta silicate sites has an average length from $10\mu\text{m}$ to 10mm.

102. The product of claim 100, in which the calcium meta silicate sites has an average length from $50\mu\text{m}$ to 5 mm.

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103. The product of claim 62, in which the weight ratio calcium silicate sites/alumina-silica phosphate bonds of the inorganic binder is comprised between 0.1 and 1.1.

104. The product of claim 62, in which the weight ratio calcium silicate sites/alumina-silica phosphate bonds of the inorganic binder is comprised between 0.3 and 0.9.

105. The product of claim 62, in which the weight ratio calcium silicate sites/alumina-silica phosphate bonds of the inorganic binder is comprised between 0.4 and 0.7.

106. A kit for the preparation of an inorganic binder having calcium silicate sites which are connected the one with the other by alumina-silica phosphate bonds, the calcium silicate sites acting as cross-linking sites for the alumina-silica phosphate bonds with a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.3 :1 and 10 :1, said kit comprising :

a container containing a water insoluble calcium silicate, and
at least one container containing at least one compound suitable for preparing an acid alumina-silica phosphate solution, in which the silica is solubilized .

107. The kit of claim 106, which comprises at least a container containing at least one acid suitable for preparing an acid alumina-silica phosphate solution with a pH lower than 1.5 measured at 20°C.
- 5 108. The kit of claim 106, which comprises at least a container containing at least one acid suitable for preparing an acid alumina-silica phosphate solution with a pH lower than 1 measured at 20°C.
- 10 109. The kit of claim 106, in which the container containing a water insoluble calcium silicate further contains silicon containing fibers with a length of less than 1000 μ m.
- 15 110. The kit of claim 106, in which the container containing a water insoluble calcium silicate further contains silica flour with an average particle size of less than 500 μ m.
- 20 111. A kit for the preparation of an inorganic binder having calcium silicate sites which are connected the one with the other by alumina-silica phosphate bonds, the calcium silicate sites acting as cross-linking sites for the alumina-silica phosphate bonds with a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.3 :1 and 10 :1, said kit comprising :
- 25 a container containing a water insoluble calcium silicate, and at least one container containing at least an acid alumina-silica phosphate solution, in which the silica is solubilized .
- 30 112. The kit of claim 111, which comprises at least one container containing at least an acid alumina-silica phosphate solution with a pH lower than 1.5 measured at 20°C.
- 35 113. The kit of claim 111, which comprises at least one container containing at least an acid alumina-silica phosphate solution with a pH lower than 1 measured at 20°C.

114. The kit of claim 111, in which the container containing a water insoluble calcium silicate further contains silicon containing fibers with a length of less than $1000\mu\text{m}$.

- 5 115. The kit of claim 111, in which the container containing a water insoluble calcium silicate further contains silica flour with an average particle size of less than $500\mu\text{m}$.

- 10 116. A process for the preparation of an inorganic binder having calcium silicate sites which are connected the one with the other by alumina-silica phosphate bonds, the calcium silicate sites acting as cross-linking sites for the alumina-silica phosphate bonds with a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.3 :1 and 10 :1, in which water insoluble calcium silicate particles are mixed with an acid alumina-silica phosphate solution at a temperature lower than 50°C , said acid alumina-silica phosphate solution comprising solubilized SiO_2 and having a pH of less than 2, ,
15 said alumina-silica phosphate solution having a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.3 :1 and 10 :1.

- 20 117. The process of claim 116, in which water insoluble calcium silicate particles are mixed with an acid alumina-silica phosphate solution at a temperature lower than 50°C , said acid alumina-silica phosphate solution comprising solubilized SiO_2 and having a pH of less than 1.5, said alumina-silica phosphate solution having a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.6 :1 and 6 :1.

- 25 118. The process of claim 116, in which water insoluble calcium silicate particles are mixed with an acid alumina-silica phosphate solution at a temperature lower than 50°C , said acid alumina-silica phosphate solution comprising solubilized SiO_2 and having a pH comprised between 0.5 and 1.5, said alumina-silica phosphate solution having a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.6 :1 and 6 :1.

- 30 119. The process of claim 116, in which the weight ratio water insoluble calcium silicate particles / solubilized SiO_2 present in the alumina-silica phosphate solution is greater than 1.

120. The process of claim 116, in which the weight ratio water insoluble calcium silicate particles / solubilized SiO₂ present in the alumina-silica phosphate solution is greater than 1.5.

5 121. The process of claim 116, in which the calcium silicate particles are calcium meta silicate particles having a substantially acicular nature with a length/diameter ratio from 2/1 to 50/1.

10 122. The process of claim 116, in which the calcium silicate particles are calcium meta silicate particles having a substantially acicular nature with a length/diameter ratio from 3/1 to 20/1.

123. The process of claim 121, in which the calcium meta silicate particles have an average length from 10 μ m to 10mm.

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124. The process of claim 122, in which the calcium meta silicate particles have an average length from 50 μ m to 5 mm.

125. The process of claim 116, in which the calcium silicate particles act as cross-linking sites for alumina-silica phosphate bonds.

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126. The process of claim 116, in which the weight ratio calcium silicate particles/alumina-silica phosphate solution is comprised between 0.1 and 1.1.

25 127. The process of claim 116, in which a filler is mixed with the calcium silicate particles before being mixed with the acid alumina-silica phosphate solution.

128. The process of claim 116, in which a filler is mixed to the mixture calcium silicate/alumina - silica phosphate solution, before its hardening.

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129. The process of claim 116, in which the hardening of the binder is carried out at a temperature comprised between 0°C and 50°C.

130. The process of claim 116, in which the binder is hardened under pressure.

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131. The process of claim 116, in which the amount of calcium silicate added to the acid silica alumina phosphate solution is such that the weight ratio calcium silicate / SiO₂ present in the acid solution is comprised between 1 and 5.

5 132. The process of claim 116, in which the amount of calcium silicate added to the acid silica alumina phosphate solution is such that the weight ratio calcium silicate / SiO₂ present in the acid solution is comprised between 1.5 and 3.5.

10 133. The process of claim 116, in which the amount of calcium silicate added to the acid silica alumina phosphate solution is such that the weight ratio calcium silicate / SiO₂ present in the acid solution is greater than 2.

134. The process of claim 116, in which the acid silica alumina phosphate solution is prepared by mixing a silica - alumina mixture with an acid consisting
15 substantially only of phosphoric acid.

135. The process of claim 134, in which further silica and alumina is added to the formed acid solution.

20 136. The process of claim 116, in which the acid silica alumina phosphate solution is prepared by mixing silica particles with an acid consisting substantially only of phosphoric acid, and by mixing thereafter to the silica containing solution alumina particles.

25 137. The process of claim 116, in which the acid silica alumina phosphate solution is prepared by mixing alumina particles with an acid consisting substantially only of phosphoric acid, and by mixing thereafter to the alumina containing solution silica particles.

30 138. The process of claim 116, in which the acid silica alumina phosphate solution is prepared at least by mixing precipitated silica with an acid solution with a pH lower than 1.5.

35 139. The process of claim 116, in which inert silicon containing fibers with a length of less than 1000 μ m are mixed to the mixture calcium silicate/alumina - silica phosphate solution, before its complete hardening.

140. The process of claim 116, in which inert silicon containing fibers with a length of less than $1000\mu\text{m}$ are mixed to the alumina - silica phosphate solution before the adding of water insoluble calcium silicate particles.

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141. The process of claim 116, in which inert silicon containing fibers with a length of less than $1000\mu\text{m}$ and water insoluble calcium silicate particles are added together to the alumina - silica phosphate solution.

10 142. A process for the manufacture of a product comprising a support provided with at least a hardened layer comprising an inorganic binder having calcium silicate sites which are connected the one with the other by alumina-silica phosphate bonds, the calcium silicate sites acting as cross-linking sites for the alumina-silica phosphate bonds with a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.3 :1
15 and 10 :1,

in which at least partly a face of the support is contacted with a composition before its complete hardening, whereby said composition comprising at least :

an inorganic binder having calcium silicate sites which are connected the one with the other by alumina-silica phosphate bonds, the calcium silicate sites acting as
20 cross-linking sites for the alumina-silica phosphate bonds with a weight ratio $\text{Al}_2\text{O}_3/\text{SiO}_2$ ranging from 0.3 :1 and 10 :1, and

a filler, and

in which the composition is hardened on said support.

25 143. The process of claim 142, in which the composition contacting the support comprises silicon containing fibers with a length of less than $1000\mu\text{m}$, the weight content of silicon containing fibers with a length of less than $1000\mu\text{m}$ in the composition after its hardening and after removal of the possible free water being of at least 0.5%.

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144. The process of claim 142, in which at least a portion of a face of the support not contacted with the composition is provided with a water repellent coating.

145. The process of claim 144, in which the water repellent coating is a fluoro
35 silicon coating.

146. The process of claim 142, in which at least one face of the support intended to be not contacted with the composition is provided with a water repellent coating.

147. The process of claim 146, in which at least partly a face of the support is
5 provided with a water repellent coating prior contacting at least partly a face of the support with the composition.

148. The process of claim 142, in which at least a portion of a face adjacent to a
portion of a face provided with a hardened layer are provided with a water repellent
10 coating.